3/4 B.Tech - SIXTH SEMESTER

EC6T2   **Microprocessors & Microcontrollers**   **Credits: 4**

Lecture : 4 periods/week   **Internal assessment: 30 marks**
Tutorial: 1 period /week   **Semester end examination: 70 marks**

Course objectives:

- To develop an in-depth understanding of the operation of microprocessors and microcontrollers, and write assembly language programs
- to be able to understand and implement microprocessor interfacing techniques
- To be able to design and implement microprocessor-based systems in both hardware and software
- to be able to apply this knowledge to more advanced structures

UNIT-I
Introduction to Microprocessors: Introduction and evolution of microprocessors, classifications, 8085 microprocessor architecture, pin layout, instruction set in 8085

UNIT-II
Architecture and features: Architecture of 8086, pin details of 8086, minimum mode and maximum mode, timing diagrams, Addressing modes, introduction to Tasm for assembly language programming.

UNIT-III
Instruction sets and programming of 8086: Data transfer instructions, arithmetic instructions, logical instructions, flag manipulation instructions, control transfer instructions, shift / rotate, string instructions & programs

UNIT-IV
Interfacing 8086: Memory & IO interfacing, Interfacing with peripheral ICs like 8255, 8254, 8279, 8259, etc. Interfacing 8255 with ADCs, and DACs etc. Initialization of control and command words.

UNIT-V
Microcontroller: Introduction to 8051 microcontroller, architecture, memory organization, special function registers, processor status word, power Modes in 8051.

UNIT-VI
Instruction set and programming: Addressing modes of 8051, instruction set of 8051, Assembler directives and programming examples

UNIT-VII

Hardware Features: Parallel ports in 8051, external memory interfacing, timers in 8051, interrupts of 8051, interfacing programming examples of ADC, DAC, LCD, Applications.

UNIT-VIII
Advanced Processors: Architecture & general description of 80186, 80286, 80386, 80486 processors, protected mode of operation of Pentium processor.

Learning Resources

Text Books:

1. Microprocessors & Interfacing Douglas.V. Hall, 3rd Edition, Pearson/ PHI. 2007
2. Microprocessors & Controllers, N.Senthil Kumar Oxford university press 2010.

References:

1. Microcontrollers, Architecture, programming, interfacing and system design, Rajkamal,Pearson, 4th edition.2010
2. Micro Computer System 8086/8088 Family Architecture, Programming and Design - By Liu and GA Gibson, 2nd Ed., PHI,
3. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, Tata Mc Hill, 2000.
4. Micro Controllers – Deshmukh, Tata McGraw Hill Edition.6th reprint, 2007.